DOCUMENT RESUME

ED 131 280 95 CE 008 731

AUTHOR Mannebach, Alfred J., Ed.
TITLE Source Units Developed as Part of an Internship Program in Agriculture/Agribusiness.
INSTITUTION Connecticut State Dept. of Education, Hartford. Div. of Vocational Education.; Connecticut Univ., Storrs. Dept. of Higher, Technical, and Adult Education.
SPONS AGENCY Office of Education (DHEW), Washington, D.C.
BUREAU NO 504-A-150003F
PUB DATE Jul 76
GRANT G-310-75-003-(504)
NOTE 64p.

EDRS PRICE MF-$0.83 HC-$3.50 Plus Postage.
DESCRIPTORS *Agribusiness; Instructional Materials; *Skill Development; Teacher Developed Materials; Teaching Guides; Teaching Skills; *Vocational Agriculture

ABSTRACT

This guide includes 12 source units of instruction developed by teachers of vocational agriculture who participated in an internship program in agriculture/agribusiness, which was designed to up-date the knowledge and skills of teachers of vocational agriculture in their areas of teaching specialization and to develop source units of instruction based upon the experiences of the interns. Each source unit follows a common format which includes a situation, motivational questions, motivational activity, teacher objectives, content, materials and equipment needed, and references. The units cover (1) Dog Grooming, (2) Floral Arranging, (3) Marking and Tallying Forest Products, (4) Horsemanship, (5) Managing a Small Stable, (6) Establishing a Retail Produce Agribusiness by Wholesale Buying, (7) Harvesting Logs from the Woodlot, (8) Servicing and Maintaining Small Gasoline Engines, (9) Operating and Maintaining Chainsaws, (10) Equitation: Improving Riding Skills, (11) Maintaining Herd Health, and (12) Selling Farm and Garden Supplies. (WL)

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# SOURCE UNITS

Developed as Part of an

INTERNSHIP PROGRAM IN
AGRICULTURE/AGRIBUSINESS

Edited By:
DR. ALFRED J. HANNEBACH

Conducted By

The Department of Higher, Technical and Adult Education
School of Education
University of Connecticut

In Cooperation With

Teacher Education
Division of Vocational Education
Connecticut State Department of Education

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Grant Number G-310-75-003 (504)
Project 504 A 150003F
Education Professions Development Act

July, 1976

CE 008 731

## PREFACE

This publication includes source units of instruction developed by teachers of vocational agriculture who participated in an "Internship Program in Agriculture/Agribusiness." The program, offered by the University of Connecticut and funded by the Connecticut State Department of Education, Division of Vocational Education, through EPDA funds, was designed to up-date the knowledge and skills of teachers of vocational agriculture in their areas of teaching specialization and to develop source units of instruction based upon the experiences obtained by the interns enrolled in the program.

The need for the program was expressed from several sources. Rapid changes have taken place in the dynamic field of agriculture/agribusiness. Teachers of vocational agriculture have periodically expressed a need to update their practical and technical knowledge and skills. Also, teachers of vocational agriculture are always looking for ways to obtain up-dated experiences, to incorporate new experiences into previous experiences and to infuse up-dated knowledge and skills into teachable units of instruction which will be relevant to their students.

This publication includes twelve source units developed by the eleven students who participated in the internship program. Each student enrolled in the program was required to develop a source unit of instruction in an area of interest and need to them. The source units developed were based upon the experiences obtained by the interns in the cooperating agricultural firms.

The source units developed follow a common format. At the beginning classroom session, several source unit formats were perused. After considerable discussion, a general format was agreed upon. However, each intern was allowed to develop the "content" portion of the source unit according to his or her needs.

The source units do not cover a complete domain of knowledge in a given area. They were designed as three, four or five week units to be integrated into the vocational agriculture curriculum on a need basis. The source units are presented here so that other vocational agriculture teachers may benefit from the experiences obtained by those enrolled in the internship program.

ACKNOWLEDGEMENTS

The author wishes to express his gratitude to those who have contributed to the success of the internship program. Sincere appreciation is extended to David Monroe, Acting Head, Glastonbury Regional Vocational Agriculture Center, for the use of the center for the classroom part of the internship program and for the arrangements made.

Appreciation is extended to Frank Atwood, Fred Clark, Robert deC. Hughes, Roger Lawrence, Dr. Raymond Ross, and Arthur Speilman, Jr., members of the Project Advisory Committee, who offered valuable suggestions regarding to operation of the program. Sincere appreciation is given to Lydia Bartinik, student helper, who typed the source units and the descriptive report and to Abina Havens and Debbie Palmer, departmental secretaries, who assisted with administrative details.

Special recognition is due to Roger W. Lawrence and Sidney Cohen, Division of Vocational Education, Connecticut State Department of Education, and Dr. Glenn C. Atkyns, Head, Department of Higher, Technical and Adult Education, School of Education, University of Connecticut, for their assistance in planning and facilitating the operation of the internship program.

Appreciation is also extended to the personnel in the cooperating agricultural firms who opened their doors and provided excellent experiences for the instructors enrolled. A special thanks goes to the interns for their enthusiasm regarding the program, for their aggressive involvement in the agricultural firms, and for their participation in source unit development.

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# DOG GROOMING

## A SOURCE UNIT IN SMALL ANIMAL CARE

Frederick W. Berggren
Lyman Hall High School
Wallingford, Connecticut

UNIT: Dog Grooming

SITUATION:

This is a four week unit designed for Sophomores and Juniors. The unit may be taught at any season, but preferably during the warm weather when insect pests can be observed.

MOTIVATIONAL QUESTIONS:

1. How many of you have ever had your dog to a grooming establishment?
2. What was the cost?
3. Who has bathed, clipped, and brushed your dog?
4. What problems have you had in grooming your dog?
5. Can a skilled person earn a living as a pet groomer?

MOTIVATIONAL ACTIVITIES:

1. Brainstorm to determine skills needed as a dog groomer.
2. Take a field trip to a grooming establishment to have the students realize the scope of dog grooming and to observe career opportunities.

TEACHER OBJECTIVES:

- To have each student properly bathe and groom a dog.
- To become familiar with the clipping and hair styling of the various breeds.
- To develop entry skills in the field of grooming.

CONTENT:

Questions and Answers

1. Why should your dog be groomed?
   - The dog enjoys the attention.
   - He will be happier, healthier, cleaner, and better looking.
   - He will learn to be handled, thus making the veterinarian's job easier.
   - While grooming, you can better observe the animal's health, including body condition, parasites, injuries, etc.
   - Prevents hair mats.
   - Removes dirt, fleas, lice, ticks.
   - Distributes the hair oil to glisten the coat.
   - Provides better insulation and cooling for your dog.

CONTENT: (Continued)

Questions and Answers

2. How often should dogs be groomed?
   - It depends upon the breed, the more often the better.
   - Short-haired breeds, daily to weekly.
   - Poodles and long-haired breeds, daily.

3. Where should they be groomed?
   - A grooming table is recommended. This is a table with a rubber mat that has an elbow pipe about two feet over the table from which a restraining leash is attached. The table is similar to a sheep-blocking table.

4. What equipment is needed?
   - One soft and one stiff brush, a medium and a course metal comb, nail clippers, a metal slicker, a tangle comb, a mat knife, some thinning shears, a blunt-nose scissors, hound gloves, a soft cloth, alcohol, cotton, and baby oil.

5. How should short-haired dogs be brushed?
   - Brush firmly with the grain of the hair using a medium brush or hound glove, then wipe with hands or soft cloth.

6. How should long-haired dogs be brushed?
   - Use a firm bristle brush and comb feathering.
   - On collies, shepherds and other double-coated breeds, brush from the skin out and then finally with the lie of the hair.
   - On breeds whose coats should stick out, brush against the lie of hair.
   - On matted hair, loosen with a course comb and fingers (soften if necessary with a drop of baby oil) and then cut with mat knife or thinning shears.

7. When should a dog be bathed?
   - When the dog is dirty (use common sense). The general rule is 6 weeks between baths.
   - Don't expose a wet dog to cold until thoroughly dry.
   - It is a fallacy that dogs should not be bathed until a year old.

8. What should be done before bathing a dog?
   - Put the dog on the grooming table and restrain with an adjustable neck band.
   - Remove the collar.
   - Clean wax from the ears with a cotton swab dipped in alcohol ( do not go too deep) and inspect for ear mites.
   - Pluck hair from inside of ear canal.
   - Plug ear canal with dry cotton to prevent water from entering canal (Don't forget to remove cotton after the bath).
   - Clip toenails if necessary (Don't cut into the quick). If bleeding occurs, cauterize with silver nitrate.

CONTENT: (Continued)

Questions and Answers

- Remove any mats or tangles.
- Brush or comb hair and remove any foreign bodies such as straw, shavings, dirt, burrs, etc.
- Wipe eyes with cotton. Wet and apply a mild eye salve (Use veterinary opthalmic ointment).
- Clean anal glands to eliminate doggy odor. Squeeze glands with paper towel or gauze pads (Glands are at 4 and 8 o'clock in rectum).

9. What materials are needed?
   - Bathtub, the top of the tub should be above waist height for convenience.
   - Hot and cold adjustable faucet with a flexible hose and spray-head attachment.
   - Shampoos (available at pet stores), medicated and plain.
   - Medicated dips (available at pet stores) for fungus, fleas, and mange.
   - Towels and electric hair dryers.
   - Equipment listed under Question #4.

10. How should the dog be bathed?
   - Place the dog in the tub.
   - Wet thoroughly with 100°F water.
   - Apply shampoo, scrub with fingers (as you would your own hair) the entire body; sponge lightly over the eyes, nose and mouth. Don't allow the shampoo to go into the eyes, nose, mouth, or ears.
   - Rinse thoroughly with the adjustable spray nozzle.
   - Re-shampoo.
   - If medicated dip is needed, sponge it on at this time. Follow instructions in the label.
   - If plain shampoo is used, after rinsing well with water, towel dry. Put dog in cage under an electric non-heated hair dryer about six inches from the animal's body.
   - If medicated dip is used, do not towel dry as this will remove the medication. Just use the dryer.
   - If the dog is a poodle, brush while drying as this fluffs the hair.

11. What are some breeds which need special grooming and trimming to look their best?
   - References 3 through 8.

12. How can you determine the appropriate hair style for these breeds?
   - References 3 through 8. Trim to breed specifications or owner's directions.

13. How are these hair styles done?
   - References 3 through 8.

CONTENT: (Continued)

Questions and Answers

14. What equipment is needed?
    - Materials in Question 4 plus electric clippers with various sized cutting blades and a spray can of blade lubricant.

15. How should the equipment be cared for properly?
    - Wash out the bath tub and apply disinfectant.
    - Wash the grooming table and disinfect.
    - Electric clipper blades, scissors, all metal combs and equipment washed, sterilized (either boiled or soaked in chemical sterilants), dried, sprayed with lubricant, and returned to storage area.

16. Are there any other important facts to consider?
    - If the dog has a nasty disposition and needs a tranquilizer to work safely on him, always notify the owner first. If the owner objects, refuse to work on the dog.
    - If you find that a dog has a cut, an enlargement of any part of his body, or any abnormality of the skin or body, notify the owner before beginning work.
    - Get the owner's preference on the type of hair styling desired. (Once hair is removed, it can not be replaced. You can always take off more hair).
    - Never use an electric clippers on a dirty dog (It is a sure way to dull blades). The dog may also get razor burn.
    - Use clipper lubricant often (As the motor slows up).
    - Keep clipper blades sharp.
    - If using a medicated dip for a skin condition, fleas, or ticks, do not use a flea collar for at least 10 to 14 days.
    - Rinse shampoos thoroughly. Do NOT rinse medicated dip, just dry.
    - Do NOT use a heated dryer.
    - Protect eyes, ears, nose and mouth from shampoo or dip.
    - Apply a silicone grooming powder to prevent itch on areas cut close with clippers.
    - Be careful not to cut the skin with clippers or scissors.
    - After sterilization of metal equipment, dry and spray with lubricant.
    - Never leave the dog while under restraint. He may jump off the table and be strangled.

MATERIALS AND EQUIPMENT NEEDED:

Grooming table.
Stool or chair.
Bath tub with variable temperature faucet.
Flexible spray head.
Various shampoos for dry and oily skins.
Medicated shampoos for fungus problems.
Medicated dips for insect and fungus problems.
Electric hair dryers.
Towels, paper and turkish.
Cages and/or kennel.
Hemostat.

MATERIALS AND EQUIPMENT NEEDED: (Continued)

Electric clippers with multiple-sized blades.
Electric clipper lubricant.
Trimming scissors, straight and curved.
Thinning scissors.
Nail clippers.
Silver nitrate applicators for toe bleeding.
Fine and course combs.
Electric waterbath sterilization chamber.
Newspapers.
Hound glove.
Wire slicker.
Mat and tangle comb.
Mat knife.
Short bristle brush.
Opthalmic ointment for the eye.
Cotton, cotton swabs, and guaze pads.
Alcohol and Boric Acid.
Medicated ear drops.
Disinfectant solutions for clean up.
Tranquilizer pills.
Restraining devices.

REFERENCES:

1. Cuneo (Miss). Poodle Clipping Book. New York, New York: Sterling Publishing Co.,

2. Durham-Enders Co.: Complete Trimming Charts. Mystic, Connecticut, 1953.

3. Dog Owners Guide to Grooming. White Plains: Gaines Dog Research Center.

4. Kohl, Sam and Goldstein, Catherine. The All Breed Dog Grooming Guide. New York, New York: Arco Publishing Co., 1975.

5. Miller, Dana. How to Clip Your Poodle. Harrison, New Jersey: Sternco Industries Inc.

6. Purina Dog Care Center. Handbook of Dog Care. St. Louis, Missouri.

7. Stone, Pearl. Clipping and Grooming Your Poodle. New York, New York: Arco Publishing Co., 1974.

8. Stone, Ben. Clipping and Grooming Your Terrier. New York, New York: Arco Publishing Co., 1975.

# FLORAL ARRANGING

## A SOURCE UNIT IN ORNAMENTAL HORTICULTURE

Douglas H. Butterfield
Vocational Agriculture Instructor
Killingly High School
Danielson, Connecticut

**UNIT:** Floral Arranging

**SITUATION:**

This is a five week unit designed for Juniors and Seniors who have already had a basic unit in Floral Design. It's important that the students know the basic principles of design, the use of color, and how to make bows. This unit is best taught in the winter near the holidays when area florists are busier and maximum benefit can be achieved from field trips. However, January is the ideal time because cost of flowers is extremely high in December, Valentine's Day, and Easter.

**MOTIVATIONAL QUESTIONS:**

1. Has anyone made any arrangements since the last course in basic floral design? What? Did you have any problems?
2. How many of you are working for a florist? How many of you would like to?
3. Does anyone here know what the most popular arrangement is that a florist makes?

**TEACHER OBJECTIVES:**

At the end of the unit each student should be able to arrange three types of colonial bouquets (round, cascading, and crescent) and be able to design a funeral spray and a funeral basket. Students should also be able to figure the price of an arrangement.

**CONTENT:**

| Objective | Activities |
|---|---|
| A. Designing a round colonial bouquet. | 1. Have the students list the different uses of colonials. Reference 1, pp 186-200.<br>2. Have students list the types of flowers used in colonials. Reference 1, pp208-209.<br>3. Hand out a list of other materials used in colonials and explain. Reference 1, pp 202-206.<br>4. Demonstrate how to make a colonial.<br>5. Have each student make a colonial.<br>6. Help students point out good and bad points of the different arrangements.<br>7. Students should try to price their bouquets. |

CONTENT:

| Objective | Activities |
|---|---|
| B. Making cascading bouquet arrangements. | 1. Explain how a cascade is made and attached to the colonial.<br>2. Demonstrate how to make a cascading bouquet.<br>3. Have each student make a cascading colonial.<br>4. Help students point out the good and bad points of each arrangement. |
| C. Developing proficiency in making a crescent bouquet. | 1. Explain the basic differences between crescent bouquets and the others. Reference 3, pp 159-243.<br>2. Demonstrate how to make a crescent bouquet.<br>3. Have each student make a crescent bouquet.<br>4. Take a field trip to a florist who will demonstrate the various ways that he makes colonials.<br>5. If possible, have a florist come in to work with students making another colonial.<br>6. Have a florist point out the good and bad points of student arrangements. |
| D. Understanding the principles of a funeral spray. | 1. Have students list the differences between funeral arrangements and other types of arrangements. Reference 3, pp 245-275.<br>2. Have students list the types of flowers used in funeral work. Reference 3, pp 275-291.<br>3. Hand out a list of materials used in funeral work and demonstrate how they are used. Reference 5<br>4. Show slides of completed funeral pieces.<br>5. Demonstrate how to make a funeral spray.<br>6. Help students make a funeral spray.<br>7. Help students point out good and bad points of each spray. |
| E. Developing skills in arranging funeral baskets. | 1. Make a list of the different types of containers used for basket arrangements.<br>2. Show pictures and slides of completed arrangements.<br>3. Demonstrate how to make a basket arrangement.<br>4. Take a field trip to a florist that will demonstrate how to make a basket arrangement.<br>5. Have each student make a basket arrangement.<br>6. Help students to arrive at a price for their arrangements. |

EVALUATION AND APPLICATION:

At the end of five weeks each student should be able to pass a written test on the basic concepts of floral arranging and be able to make a satisfactory arrangement in a given period of time (eg. 15 minutes). If possible, some students should be placed at a retail florist for continued experience.

MATERIALS AND EQUIPMENT NEEDED:

Fresh flowers each week
Fresh greens (can be gathered by students, eg. mountain laurel, boxwood, and cedar)
Styrofoam holders
2" sheet styrofoam
Green spray paint
#18 florist wire
#22 florist wire
Metal picks
4" wooden picks
Green chenial stems
Floral tape
Scissors
Knives
#9 acetate ribbon
#40 water pics
Assorted baskets
NFC oasis
Corsage boxes
Green tissue paper
Order blanks
Sympathy cards

REFERENCES:

1. Benz, M. Flowers: Geometric Form, Houston, Texas: San Jacinto Publishing Co., 1966.
2. Carnations: Elegance in Floral Arrangements, Denver, Colorado: Colorado Flower Growers Association Inc., 1968.
3. Hixson, Bill Flower Arranging, Vol. I, Keisen Engei Center, Tokyo, 1971.
4. Rockwell, F.F. The Rockwells' New Complete Book of Flower Arrangement. Cardin City, New York: Doubleday and Co. Inc., 1960.
5. Slide Set. Designing with Flowers and Decorative Materials, Cornell, New York: Instructional Materials Service.

Additional information can be obtained form two Floral Trade Organizations: F.T.D. and Florafax.

# MARKING AND TALLYING FOREST PRODUCTS

## A SOURCE UNIT IN NATURAL RESOURCES

Richard E. Colson
Vocational Agriculture Instructor
Killingly High School
Danielson, Connecticut

UNIT: Marking and Tallying Forest Products

SITUATION:

This unit is designed for Juniors and Seniors. Perhaps it would be best to teach the unit in the early fall. Approximately six weeks is required to teach the unit, twelve weeks should be allowed with harvesting.

MOTIVATIONAL QUESTIONS:

1. How many of you have a woodlot?
2. Have any of you ever marked trees in your woodlot?
3. Have you ever observed persons marking and tallying trees in the forest?
4. The Vo-Ag Department owns 20 acres of wood land. We know that many of the trees will yield saw logs. How will we determine which trees we should harvest?

MOTIVATIONAL ACTIVITIES:

1. Have the class walk through the forest.
2. Have the students estimate the number of logs in trees.
3. Have the students estimate the number of board feet in a given area.
4. Have the students estimate the amount of profit that can be made from a given stand.

TEACHER OBJECTIVES:

At the end of this unit the students will be able:

1. To identify the 20 major economic forest trees of Northeast Connecticu
2. To identify sites for the following:
   a. Yarding area/Landing area
   b. Skidding road
3. To properly mark trees for the following uses;
   a. Cord wood/firewood
   b. Cull trees
   c. Saw logs
   d. Wildlife trees
   e. Superior seed trees (phenotype)

4. To use the following equipment:
   a. D.B.H. tape
   b. Biltmore stick
   c. Calipers
   d. Clinometer
   e. Increment bore
5. To keep an accurate tally sheet.

CONTENT:

| Objective | Activity |
|---|---|
| A. Identifying trees. | 1. Have the students make up a key of the economic species of the area.<br>2. Have the students observe and identify one each of the desired tree species by: leaves, bark, and twigs. These trees may be used as reference trees by the students so make sure that each tree selected is a typical example of the species in question. Tag and mark each tree.<br>3. After the students are able to identify the marked tree, have them identify different trees of the same species.<br>4. As the students are walking through the woods, the instructor should point out sites to be used as:<br>a. Yarding or landing areas. Cut flat areas that can be clear to be used to store piles of logs before they are trucked to the sawmill or pulpmill. This area should be near a main road or near a smooth open logging road to handle logging trucks.<br>b. Skidding roads. Small roads used to skid logs from the growing site to the yarding area. It is important to consider the topography of the land, as these roads will be subject to erosion if not laid out against the contour of the land. Improper placement could also result in excessive silting of the watershed. It is also important to consider damage to existing trees in the stand that will not be harvested. |

EVALUATION AND APPLICATION:

1. The students should be able to identify the following species;

| | | |
|---|---|---|
| Ash, white | Hickory, Mockernut | Oak, white |
| Beech | Hickory, Pignut | Pine red |
| Birch, black | Hickory, shag bark | Pine, white |

| | | |
|---|---|---|
| Birch, gray | Larch | Poplar |
| Cedar, E. Red | Maple, red | Spruce, blue |
| Cherry | Maple, sugar | Spruce, white |
| | Oak, red | Walnut, black |

2. Given an area of the forest, the students should be able to choose yarding areas and skidding roads. They should also be able to give reasons for their selection.

| Objective | Activity |
|---|---|
| B. Measuring the diameter of standing trees (To give the area of the butt log.) | 1. Have the students measure all trees at 4½' off the ground unless the bole has an unusual shape. Take a regular tape measure and figure the area of the butt log and its diameter. (The students will find this to be very long and tedious, not to mention inaccurate due to math errors).<br>2. Ask the students if they can think of a better way to do this procedure.<br>3. Instruct the students to use the three major tools for finding diameter:<br>a. D.B.H. tape<br>b. Biltmore stick<br>c. Calipers<br>4. As the students gain skill with each of the tools, they will find the calipers or biltmore stick faster and easier to use on most of the forest trees of New England.<br>5. Have the students measure all of the trees used in Activity #1 with the tool of their choice. Note the difference in time and accuracy in using forestry tools designed for the purpose. |

EVALUATION AND APPLICATION:

The students will be able to use the following tools for determining diameter at breast height: D.B.H. tape, Biltmore stick, and Calipers. The students will use trees of known diameter at breast height. Ten trees will be figured by each tool.

| Objective | Activity |
|---|---|
| C. Using the clinometer | 1. We now know how to measure the D.B.H. of forest trees. It is impossible to determine the volume of wood in trees without estimating the height of the trees. How can we do it? |

CONTENT: (Continued)

| Objective | Activity |
|---|---|
| | 2. In order for the students to learn to estimate height of standing timber, the clinometer is often used. After mastering the use of this instrument, the students can measure the height of several trees. The students can estimate the number of logs (1 log = 16 feet), the tree will yield and check his/her estimation with the clinometer. |

EVALUATION AND APPLICATION:

At the end of this section the students will be able to determine the D.B.H. and the number of logs (correct to the nearest one-half log) of 15 standing trees.

| Objective | Activity |
|---|---|
| D. Using the increment bore or increment hammer. | 1. We now know how to figure the volume of wood in a standing tree. It is important to us as forest managers to know the growth characteristics of the trees we are working with. We usually do not want to harvest a rapidly growing tree. It is more economical to harvest slow growing trees and allow the rapid growing trees to keep on growing.<br>2. We want to observe the growth rings without harming the tree. The tool used to perform this task is the increment bore. Introduce the proper use of this tool to the class.<br>3. The students can take several samples from various trees to determine what trees are growing fastest.<br>a. Is there a difference in growth rate between supressed trees and dominent trees?<br>b. Is there a difference in growth rate between hardwoods and softwoods?<br>c. Note the difference in the density of hardwood vs. softwood. |

EVALUATION AND APPLICATION:

At the end of this section, the students should increment bore ten trees and by the condition of the bore sample, explain why the trees should be left to grow or should be harvested.

The student should be able to recognize trends that are taking place. For example, supressed trees tend to be slow growers.

| Objective | Activity |
|---|---|
| E. Tallying and marking trees | 1. Show the students how to use the paint marking gun. If the trees marked are to be harvested, use paint; but if the trees will not be harvested, bright blue or orange poster paint can be used. The students should be shown the correct method for marking trees. One blaze should be made at the base of the tree below where the undercut will be made so that when the sawer fells the tree this mark will remain on the stump.<br>2. One blaze 5 feet off the ground over the stump blaze. One more blaze at a right angle around the tree to the last blaze.<br>3. The following classifications of trees based on use will keep the students in their latter working.<br>a. Cull trees - Damaged or diseased trees that will be harvested for cordwood or firewood. Undesirable species might also be cull trees<br>b. Sawlogs - Trees yielding acceptable logs that can be cut up into boards.<br>c. Superior seed trees - Trees that show superior phenotypes to be left to reseed the forest.<br>d. Wildlife trees - Trees that will be left to provide food and shelter for wildlife.<br>4. A State Forester could be used as a resource person to show the students how to keep an accurate tally on the trees to be marked and later harvested.<br>5. As a class activity, the students can make and harvest a small stand of trees. If possible, the logs should be taken to a sawmill so that the students will be able to take part in the whole process from tree to finished product. Students can also compare with their log tally the end results. |

EVALUATION AND APPLICATION:

Split the class into two groups. Each group will:

1. Evaluate the stand as to condition and species.
2. Measure and mark trees to be cut.
3. Show skidding roads and yarding areas.
4. Prepare a complete cutting plan for the area.

MATERIALS AND EQUIPMENT:

Each class should have the following equipment:

D.B.H. tape
Biltmore stick
Calipers
Clinometer
Increment bore or Increment hammer
Tally sheet and clipboard
A mixed aged stand of hardwood

REFERENCES:

Allen, Shirley and Sharpe, Grant. An Introduction to American Forestry. New York, New York: McGraw-Hill Book Co., 1970.

Baker, Frederick. Principles of Silviculture. New York, New York: McGraw-Hill Book Co., 1950.

Brockman, Frank C. Important Trees of Eastern Forests. New York, New York: Western Publishing Co., 1968.

Chapman, Herman. Forest Mensuration. New York, New York: McGraw-Hill Book Co., 1949.

Davis, Kenneth P. Forest Management. New York, New York: McGraw-Hill Book Co., 1966.

Guise, Cedric H. The Management of Farm Woodlands. New York, New York: McGraw-Hill Book Co., 1950.

Harlow, William H., and Harrar, Ellwood. Textbook of Dendrology. New York, New York: McGraw-Hill Book Co., 1969.

Shirley, Hardy L. Forestry and Its Career Opportunities. New York, New York: McGraw-Hill Book Co., 1973.

Wacherman, A.E., Hagenstein, W.D., and Michell, A.S. Harvesting Timber Crops. New York, New York: McGraw-Hill Book Co., 1966.

# HORSEMANSHIP

## A SOURCE UNIT IN ANIMAL SCIENCE

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UNIT: Horsemanship

SITUATION:

This unit is designed for Vo-Ag II or III. It is assumed that the student can identify the following basic horse breeds: Arabian, Morgan, Appaloosa, Quarterhorse, Saddlebreds, Thoroughbreds, Standardbreds, Pinto, Paints, Palomino.

It is strongly recommended that the students at some time be taught a unit on diseases of horses. Nutrition will be taught in Nutrition II. Horse judging will be taught in a separate unit.

No amount of classroom work or textbook study can substitute for handling horses. To ensure development of these abilities, a good occupational experience program is necessary with follow-up by the instructor.

MOTIVATIONAL QUESTIONS:

1. How many of you have a horse of your own?
2. How many of you have ever ridden or handled a horse?
3. What physical abilities are required to handle horses?
4. What knowledge is needed in horsemanship?
5. Did you ever see anyone get hurt by a horse?
6. Are you afraid to pick up a horse's hind foot?
7. Have you ever rented a horse at a stable?

MOTIVATIONAL ACTIVITIES:

1. Visit a stable to observe basic horsemanship.
2. Discuss horse handling, safety, stable rules, stable facilities, and clientele equipment with a horse owner or handler.

TEACHER OBJECTIVES:

To develop in each student the ability to understand horses, horse-handlin and horsemanship.

CONTENT:

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| A. What are the parts of the horse? | 1. Prepare and have students complete hand-out sheet. Reference 2 p788.<br>2. Play a game to help students identify the parts of the horse. Break the class into two groups. Keep a tally of correct answers on the board. The instructor uses a transparency and overhead projector. A part of the animal is pointed out, and each group takes turns in identifying the part. If one team misses, the other team proceeds. Tally the score at the end to determine the winning team. |
| B. What is the safe way to work around a horse? | 1. Remember that a horse has three defenses; to run, to kick, or to bite. Always let the horse know you're there; horses don't like surprises.<br>2. Have the students discuss working around a horse. Allow as many students to present situations and relate experiences as time will allow.<br>3. Discuss approaching, catching, leading, tying, bridling, saddling, and grooming. Bring in a saw horse and a saddle. Ask the students to demonstrate the proper way of putting the saddle on a horse. Comment on correct procedures and correct faults.<br><br>For detailed safety practices, refer to the following references on safety:<br>Reference 1, p 36.<br>Reference 4, pp 72-74.<br>Reference 5, pp 5-9. |
| C. What is the proper procedure for handling a horse? | 1. Always approach the horse in a calm condition. Horses are gentle by nature; keep them that way. A horse has very little reasoning ability. A horse can understand simple oral commands. Use two syllable words only, such as: Go, Whoa, No, Stop, etc.<br>2. Have the students use references and list, in order of importance, safety rules as they see them while working around horses.<br>3. Horses have the herding instinct. When not around other horses, their confidence must come from the handler. The more time one spends around the horse doing useful handling, the more confidence the horse develops. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | 4. Discuss the importance of time spent around the horses, vocabulary with the horse, approaching a horse, your horse around other horses and horse psychology.<br><br>Reference 6, pp 215-217.<br>Reference 9, pp 31-61.<br>Reference 4, pp 56-61.<br>Reference 7, pp 27-34. |
| D. What kind of senses does a horse have? | 1. Have the students discuss the senses that they've noted while working around horses. Write these senses on the board.<br>2. Have the students discuss their findings from the references.<br>3. -The eye is focused by changing the angle of the head. A horse's sight is inferior to the sight of man.<br>-Hearing is keen. The horse's attention can be noted by the direction of the ears.<br>-The horse's ability to smell is about the same as that of man. A horse does not breathe through his mouth.<br>-The horse's tastes are the same as man's. The combination of tastes is greater than man's and must be guarded against for toxic feeds.<br>-Whinnying may communicate fellowship, danger, or excitement. The sense of touch is highly developed in the horse. A horse can detect the slightest pressure. The major transmission of communication is the skin.<br>-The horse has certain inate abilities through instinct to detect outside influences.<br><br>Reference 7 pp. 13-26.<br>Reference 11, p 36. |
| E. What are some common blemishes and unsoundness in horses? | 1. Have the students relate what they know about common blemishes and unsoundness. Give as many students a chance to express themselves as time will allow.<br>2. Have the students use references and list the common blemishes and unsoundness in horses. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | 3. Blemishes are abnormalities that do not impede the horse's usefulness. The more severe abnormality that affects the service ability of a horse is unsoundness. Most defects are found in the legs.<br>4. As a person's horsemanship increases, so his ability to recognize abnormalities increases. Most vices occur through boredom.<br><br>Reference 8, pp 9-11.<br>Reference 4, pp 31-41.<br>Reference 12, pp 146-158. |
| F. What does a good horseshoeing job look like? | 1. Have the students describe what a good shoe job looks like.<br>2. Use handouts to explain to the students what to look for and how to judge quality and strength of the shoe.<br>3. Remember! No feet, no horse. Shoeing can greatly affect the way of going. Tell the farrier what you want from your horse.<br>4. The instructor should refer to any good text on horseshoeing for further information. Horseshoeing is a special skill and must be done by a prefessional farrier. The instructor should attempt to get a horse's foot and leg to help teach the anatomy and the need for proper shoeing.<br><br>Reference 4, pp 193-196.<br>Reference 6, pp 257-270.<br>Reference 9, pp 215-217.<br>Reference 11, pp 32-33. |
| G. What is the proper equipment for riding? | 1. There are three basic seats: Western, saddle, hunt or forward.<br>2. Take students on a field trip to a tack shop and have the owner describe the different kinds and quality of tack for different purposes.<br>3. Encourage students to attend horse equipment auctions. (Agawam, Mass.; Hebron, Ct.; Wissaic, NY.) Ask students to bring into class the three basic types of equipment for display and discussion. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | Reference 4, pp 188-189.<br>Reference 10.<br>Reference 9, pp 215-217.<br>Reference 11, pp 23-26. |

Evaluation and Application:

1. Have each student demonstrate the basic handling of a horse.
2. Administer unit test.
3. Observe and evaluate students who have horses or who have jobs involving horses on occupational experience program visits.

REFERENCES:


1. Horses: A Complete Management Program. Shawnee Mission, Kansas: Albers Milling Co.

2. Ensminger, M.E. The Stockman's Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1970.

3. Vocational Education Productions, California Polytechnic State University San Luis Obispo, California: "Hoof Care", and "Horse Safety".

4. Scheid, Dan W. How to Buy a Healthy Horse. Highsmith Co., Inc. Fort Stunson, Wisconsin.

5. Horse Safety Guidelines. PA 1033, Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.

6. Ulmer, Donald E., and Elwood M Juergenson, Approved Practices in Raising and Handling Horses. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1974.

7. Weikel, Bill. Understanding Horse Psychology. Farnum Horse Library, Omaha, Nebraska, 1972.

8. Horse Science, 4-H Horse Program Series, Cooperative Extension Services, 1971.

9. Butler, Doug. The Principles of Horseshoeing. 1611 E. Shore Drive, Ithaca, New York, 1974.

10. Know All About Tack, Farnum Horse Library, Omaha, Nebraska, 1972.

11. Harris, Susan. Horsemanship in Pictures. Cartland, New York.

12. Kays, B.J. The Horse. New York: A.S. Barnes and Co., 1953.

# MANAGING A SMALL STABLE

## A SOURCE UNIT IN ANIMAL SCIENCE

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**UNIT:** Managing A Small Stable.

**SITUATION:**

This source unit is designed as a four week unit for Vo-Ag III and IV students. It is best taught during the winter months. All students taking the unit should have a definite interest in stable management as a vocation and should have completed a basic unit in horsemanship.

**MOTIVATIONAL QUESTIONS:**

1. How many of you know a stable manager?
2. How much money do you think a stable manager makes by boarding a horse for a year?
3. What supplies are needed to keep a horse?
4. What capital outlay is needed to own a horse?
5. Have you ever been injured or hurt working around or riding a horse?
6. As horse owners, what kinds of records do you keep?

**MOTIVATIONAL ACTIVITIES:**

1. Visit a stable to discuss management decisions which must be made by the owner or manager.
2. Have the students estimate the cost of purchasing and boarding a horse for a year.
3. Have the students estimate the cost of starting a small stable operation.

**TEACHING OBJECTIVES:**

- To develop the awareness of students in the skills of managing a small stable.

**CONTENT:**

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| A. What business responsibilities does a manager have? | 1. Have the students list what they think to be the business responsibilities of a manager. Write these on the board and leave the list there. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | 2. Have the students use references and develop a complete list from the text of those business responsibilities.<br>3. Discuss as many of the important aspects of management as the students will be attentive to. Detail is left up to the students' interest. Suggested topics:<br>- Buying and selling of supplies<br>- Handling personnel<br>- Dealing with clientele<br>- Discussing other horse stables<br>- Using the telephone properly<br>- Maintaining equipment<br>- Keeping records<br>- Computing taxes<br>- Knowing farriers<br>- Advertising the business<br><br>Reference 1, p 414.<br>Reference 2.<br>Reference 4, pp 119-120, 154. |
| B. What legal responsibilities does a manager have? | 1. Students should be encouraged to identify as many responsibilities as they can.<br>2. Along with responsibility comes liability. One should not only protect himself and his family, but his livlihood as well.<br>3. Discuss leases, contracts, taxes, insurance, Social Security, and checks.<br><br>Reference 1, pp 874-882.<br>Reference 2, pp 65-94.<br>Reference 3, pp 23-32, 40-41. |
| C. What supplies are needed for boarders? | 1. Have the students list the primary and the important secondary supplies needed to keep a horse and that should be on hand at a stable.<br>2. Allow the students to use any magazines that your library might contain to add to this list.<br>3. Categorize the supplies under major headings.<br>4. Have the students estimate the amount of different supplies used per horse or boarder and the costs per unit. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | 5. Discuss supplies under the categories developed. Have the students explain price differences.<br><br>Reference 5.<br>Reference 6.<br>Reference 7. |
| D. What facilities are the most desirable to start a small stable operation? | 1. Have the students plan an ideal small stable.<br>2. Develop a list of factors to consider when establishing a small stable.<br>3. Have the students discuss plans and lists.<br>4. Improve plans and lists by using references.<br>5. Discuss the needs of horses and people. Have the students discuss the updated plans.<br><br>Reference 1, pp 538-540, 573-576.<br>Reference 5, see the monthly section on stable plans.<br>Reference 8, pp 204-107. |
| E. What skills in handling people should a good manager possess? | 1. Have the students list the personal traits they like in a serviceman or delivery man they know.<br>2. Have the students make a list of the personal traits they feel are very important when dealing with people. Have the students discuss how they like to be treated by other people.<br>3. Discuss what has turned students "off" from salesmen in the past.<br>4. Discuss the need for good appearance, remembering names, the use of the phone, speaking directly to an instructor, and courtesy to boarders. A person should take on a professional attitude about the business, such as "I never talk about someone's horse to a third party because it may be misquoted at a later time, and people's feelings and reputation are at stake". |
| F. What part does horsemanship play in the manager's job? | 1. Have the students relate their previous experiences with horses, managers and people.<br>2. Have the students write a paragraph or two answering this question.<br>Reference 8, pp59-74.<br>Reference 9, pp 213-256.<br>Student Notebooks. |

EVALUATION AND APPLICATION:

1. Written report on an individual study of a stable.
2. Written test.
3. Observation of the degree to which students apply management skills to their own operations or on the job.

REFERENCES:

1. Ensminger, M.E. The Stockman's Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1970.

2. Doanes Farm Managment Guide. St. Louis, Missouri, 1971.

3. Adams, R.L. Everyday Farm Law. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1955.

4. Ray, E.P. Exploring Agribusiness. Danville, Illinois: The Interstate Printers and Publishers, INC., 1967.

5. The Western Horseman. Colorado Springs, Colorado, (published Monthly).

6. The Chronicle of the Horse. Berryville, Virginia, (Publishes Monthly).

7. Horse Lovers National Magazine, San Francisco, California (Published Monthly).

8. Scheid, Dan W. How to Buy a Healthy Horse. The Highsmith Co., Inc., Fort Atkinson, Wisconsin, 1972.

9. Ulmer, Donald, and Elwood, M. Juergensen, Approved Practices in Raising and Handling Horses. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1974.

# ESTABLISHING A RETAIL PRODUCE AGRIBUSINESS BY WHOLESALE BUYING

## A SOURCE UNIT IN AGRICULTURAL BUSINESS

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**UNIT:** Establishing a Retail Produce Agribusiness by Wholesale Buying

**SITUATION:**

1. This unit is specially designed to provide direction and work experience in the field of retail produce, with the intent of motivating students towards the development of a profitable retail produce SOEP.
2. The junior or senior level is probably most suitable.
3. Estimated weeks needed:
   - Classroom instruction — 2½ weeks
   - Field experience — 1½ weeks
   - Total — 4 weeks
4. Month of year to teach:
   - May is the prime month to include this unit.
   - September should be used as a second choice.
5. Suggested prerequisite:
   - Fruits and Vegetable Crops
   - Record Keeping

**MOTIVATIONAL ACTIVITIES:**

Take the students on a field trip to a nearby well established cooperating retail produce outlet. Allow the students to browse the establishment, then have the operator give the students a functional tour of the daily ongoing operation. Be sure to have the operator identify the economical, social, and technical skills required and the psychological benefits of establishing ones' own business.

**MOTIVATIONAL QUESTIONS:**

After the field trip, the students should be ready to discuss the operations of the produce outlet. To further develop the unit, you should evaluate their present and past experiences with lead questions of this nature:

1. How many of you have ever been self employed?
2. How many of you feel self satisfaction and enjoyment with your progress and development in your work?
3. What factors must be considered before establishing your own produce outlet?

TEACHER OBJECTIVES:

To develop or support each student's knowledge of agribusiness and to provide beneficial work experience in retail produce agribusiness. Specifically to develop in each student the ability to:

1. Determine a profitable location for the produce business in accordance with state and local law.
2. Identify a means of financing ones own business.
3. Evaluate which wholesale market to buy from.
4. Identify which produce items to buy at the market, with respect to quality price, and demand.
5. Determine the quantity of produce to buy with respect to transportation, handling, storage, spoilage, and customer demand.
6. Price items at retail markup.

CONTENT:

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| A. Where should I locate my produce stand? | 1. Have the students develop a list of geographic features that would contribute to a successful business.<br>2. Arrange for the students to visit the town hall. Have the procedures for attaining a permit in accordance to the local zoning ordinance explained by qualified personnel.<br>3. As a follow through, have the students select a location for their business and apply for permission to start a business. |
| B. Where can I get money to start my business? | 1. Arrange for a guest speaker from a local bank to explain financing policies of banks.<br>2. Have the students take a survey of the loaning policies of local banks to determine which bank would suit their financial needs. |
| C. Where should I buy my produce wholesale? | 1. Have the students develop a list of regional wholesale markets. Develop an evaluation sheet on which to evaluate price, service, distance, quality, items available, etc. Present the list to local retail produce owners for their evaluation.<br>2. Discuss in class the evaluation sheets that have been filled out so students can decide upon a market from which to buy. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| D. What procedure should I follow in selecting, buying, transporting, handling, and storing produce? | 1. Arrange for the class to spend a one week period working with a cooperating retail produce operator. Have each student responsible for the processing of three produce items over this period. Incorporated the information learned into an overall summary of the entire operation. Discuss in class.<br>2. Develop an inclusive processing sheet which encompasses the following functions:<br>- Inventory before marketing and estimating the amount to be purchased.<br>- Balance the quality of the item and the price to determine if the purchase is economically sound.<br>- Determine the amount you expect to sell and the expected profit.<br>- Evaluate the item to see whether or not it fits into a comprehensive produce purchase.<br>3. Transport the produce properly and safely. Have the students load a produce truck and determine the safe quantity to transport.<br>4. Have students keep a daily record of spoilage and its causes. |
| E. What factors determine the retail price of produce? | 1. Wholesale cost is the cost to the dealer. The selling price must be higher than the dealer's cost to cover the expense of handling and selling the produce. Such items as salesman's salaries, lights, storage, rent, interest on borrowed capital, etc. go on even if there is no sale. These items of cost are covered in the markup. These cost figures plus profit determine how much difference a dealer must charge above his cost. |
| F. How do you calculate the retail price? | 1. The produce stand has to sell at a price to pay expenses and return a profit. The first cost is the wholesale cost of the produce to the business. Next the overhead or fixed costs of bringing the produce to the consumer, storage, salaries, electricity, insurance, heat, etc. must be calculated. On top of these |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| | is profit. If it takes a 20 percent markup to pay fixed costs and 10 percent profit is desir. a 30 percent markup (of selling price) is needed, E.G. an item which costs the dealer $6.00 per bushel will sell at what retail price? Using the 30 percent markup, the $6.00 represents 70 percent of selling price or 70 percent of x is $6.00. x=$8.55. |
| | 2. Have the students determine the selling price for their three produce processing items when given percent markup and wholesale cost. Have them determine percent markup or wholesale cost when other two factors are known. |

EVALUATION AND APPLICATION:

1. Short quizzes.
2. Class participation.
3. Work performance at a produce outlet.
4. Produce processing sheet completion.
5. Reports.

SPECIAL EVENTS, ACTIVITIES, REFERENCE PERSONNEL, AND TEACHING AIDS:

1. Visit with cooperating produce outlet owner.
2. Meet with Town Hall resource personnel.
3. Invite a guest speaker from the local bank.
4. Have students obtain functional work experience at a cooperating produce outlet.
5. Go to the wholesale produce market to buy produce and observe buying and selling.

REFERENCES:

1. Baumback, Clifford, Kelley, Pearce, and Lawyer, Kenneth. How to Organize and Operate a Small Business. Part 2, "Getting Started".

2. Samson, Harland, and Wingate, John. Retail Merchandising.

# HARVESTING LOGS FROM THE WOODLOT

## A SOURCE UNIT IN NATURAL RESOURCES

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UNIT: Harvesting Logs From the Woodlot

SITUATION:

This is designed as a four week unit for sophomore Vo-Ag students. It will be taught in the spring. The students have had a background in basic soil science, plant growth, and agricultural mechanics. The school has a 50 acre woodlot that needs management. The students will gain practical experience in the school woodlot and apply knowledge and skills learned to woodlots on their home farms.

MOTIVATIONAL QUESTIONS:

1. How many of you have a wooded area on your property?
2. Have you ever cut any wood for logs or for fireplace fuel?
3. Has a forester ever evaluated your woodlot or a neighbor's woodlot?
4. Do you feel your woodlot has a value? If so, what value does the woodlot have for you?

MOTIVATIONAL ACTIVITIES:

1. Show a 16mm film on forestry or woodlot management.
2. Have a State Forester speak to the class about woodlot management and careers in forestry.
3. Have a logger speak to the class about his experiences in forestry work.

TEACHER OBJECTIVES:

To develop student understanding and appreciation of:

- Safe and efficient operation of logging equipment and machinery.
- Proper woodlot management techniques; such as felling, bucking, and moving logs.
- The career opportunities in forestry.

CONTENT:

| Objective | Activities |
|---|---|
| Each student shall be able to: | |
| A. Apply first aid to minor cuts and burns. | 1. Have the school nurse demonstrate treatment of cuts and burns.<br>2. Have the students prepare to treat minor injuries. |
| B. Store fuel and use fire extinguisher properly. | 1. Have the fire chief demonstrate the proper use of the fire extinguisher.<br>2. Show new OSHA approved fuel cans to the class. |
| C. Identify and properly wear suitable safety equipment. | 1. Demonstrate and quiz students on the various safety equipment needed.<br>2. Have students dress properly for field work. |
| D. Develop a proper logging safety and warning terminology. | 1. Have a logger discuss logging warning terminology.<br>2. Practice warning terminology in a simulated situation. |
| E. Demonstrate proper log lifting, moving, and carrying methods. | 1. Use class,time to identify tools and equipment used to lift, move and carry logs.<br>2. Have a logger demonstrate the proper use of lifting, moving, and carrying equipment. |
| F. Identify potential safety hazards. | 1. Brainstorm potential safety hazards in the woods.<br>2. Develop a list of safety hazards. |
| G. Correct potential safety hazards. | 1. Have a logger demonstrate how to locate an escape route.<br>2. Remove debris from work area, such as limbs, dead trees, etc.<br>3. Appoint one student each day to be "safety engineer" for the day to monitor any hazards. |
| H. Carry equipment and tools to the work area safely. | 1. Demonstrate the proper way to carry tools, and the proper way to sheath tool edges.<br>2. Have the students carry the tools and equipment to the work area properly. |
| I. Plan and mark out a skid trail. | 1. Have a Forester discuss the details to be considered when planning a skid trail.<br>2. Use a map to plan a skid trail. |

CONTENT: (Continued)

| Objective | Activities |
|---|---|
| | 3. Visit a woodlot to see a recently used skid trail.<br>4. Plan and mark out a skid trail in the woodlot. |
| J. Establish a cutting pattern for the woodlot. | 1. Investigate each marked tree to determine the condition.<br>2. Locate large limbs that may influence direction of fall.<br>3. Locate trees with crooked trunks.<br>4. Identify sloping land that may effect the fall of the tree.<br>5. Number trees in order to be cut to eliminate skidding problems. |
| K. Identify tools and equipment used in logging. | 1. Show slides and pictures of various equipment.<br>2. Use forestry equipment catalogs.<br>3. Hand out a list of equipment to students. (See attached list).<br>4. Lay out equipment and have students identify the equipment and name important parts. |
| L. Sharpen axes, and the chain saw. | 1. Demonstrate axe sharpening and have students sharpen the axe as needed during the unit.<br>2. Sharpen the chain saw with a file and a file guide.<br>3. Demonstrate the method used to file rakers down.<br>4. Sharpen the chain saw with a chain saw sharpener unit. |
| M. Clean and adjust the chain saw, axes, and wedges. | 1. Have students clean the chain saw daily.<br>2. Demonstrate the adjustment of the chain.<br>3. Grind off mis-shapen wedges.<br>4. Cut axe handle end parallel to the head.<br>5. Demonstrate ways to keep the axe head tight. |
| N. Select tools for felling, bucking, and moving logs. | 1. Show common types of chains.<br>2. Show the differences between felling wedges and bucking wedges.<br>3. Demonstrate the use of cant hooks, peavies to roll, lift, and move logs. |
| O. Determine the proper placement of tree when felling with the chain saw. | 1. Identify causes which create problems in placing a tree.<br>2. Determine the feller's escape route.<br>3. Consider damage to other trees.<br>4. Consider the retrieval of the felled trees. |

CONTENT: (Continued)

| Objective | Activities |
|---|---|
| P. Felling trees properly. | 1. Identify marked trees to be felled.<br>2. Make the undercut: determine the proper distance from the ground, and the proper horisontal and angular cuts to make the undercut.<br>3. Make the backcut: proper height from the ground.<br>4. Demonstrate the proper hinge when making the backcut.<br>5. Demonstrate the placement of wedges.<br>6. Demonstrate the use of wedges to hold a corner.<br>7. Use the axe properly to drive the wedge. |
| Q. Felling decayed trees. | 1. Have a logger explain and demonstrate how to handle decayed trees.<br>2. Show an example of a decayed tree.<br>3. Have a logger fell a decayed tree. |
| R. Dislodge lodged trees safely. | 1. Discuss and show examples of a lodged tree.<br>2. Have a logger demonstrate how to select equipment to dislodge a tree.<br>3. Demonstrate the safe places for men and machines when dislodging a tree. |
| S. Limb felled trees. | 1. Have a logger demonstrate the proper position to handle the saw and remove the limbs.<br>2. Discuss the terrain around the felled tree.<br>3. Make limbing cuts to first remove weight from the limbs.<br>4. Make cuts flush with the tree.<br>5. Keep slash of trees to proper height. |
| T. Bucking trees with a chain saw. | 1. Select correct log lengths.<br>2. Mark the tree for bucking.<br>3. Demonstrate where and how to make the bucking cuts.<br>4. Use bucking wedges when necessary.<br>5. Make a straight cut through the log. |
| U. Set up logs for skidding to landing. | 1. Attach choker chains on trees or logs.<br>2. Bunch logs to be skidded.<br>3. Locate and develop a log landing.<br>4. Develop and maintain a skidding trail.<br>5. Measure logs with log rule and keep a tally of board feet. |

EVALUATION AND APPLICATION:

A. Have each student describe the procedures to follow in felling a specific group of trees, that will:
   1. Provide safety to the loggers.
   2. Provide the least damage to the equipment.
   3. Provide minimum damage to trees being felled and other trees.
   4. Save the maximum time and labor in the logging operation.
B. Have each student demonstrate the knowledge and skills required in fellin trees in the desired positions.
C. Have each student demonstrate the required skills in limbing trees.
D. Have each student demonstrate the required skills in bucking trees to obtain correct lengths for the intended use.

MATERIALS AND EQUIPMENT NEEDED:

A. Chain saw and accessories.
B. Safety Equipment.
C. Fuel and proper container.
D. Bar and chain oil.
E. Fire extinguisher.
F. First aid kit.
G. Wedges.
H. International log rule.
I. Choker Chains.
J. Peavies or Cant Hooks.
K. Log Skidder - if available.

REFERENCES:

1. Allen, Shirley, and Sharpe, Grant. An Introduction to American Forestry. New York, New York: McGraw-Hill Book Co., 1970.

2. Conway, Steve. Timber Cutting Practices. San Francisco, California: Miller Freeman Publishers, Inc., 1973.

3. Davis, Kenneth P. Forest Management. New York, New York: McGraw-Hill Book Co., 1966.

4. Guise, Cedric H. The Management of Farm Woodlands. New York, New York: McGraw-Hill Book Co., 1950.

5. Wacherman, A. E., Hagenstein, W. D., and Michell, A. S. Harvesting Timber Crops. New York, New York: McGraw-Hill Book Co., 1966.

6. All About Using Chain Saws. Oregon Saw Chain Division, Omark Industries.

7. Logging Farm Forest Crops in the Northeast. Bulletin No. 2008, U.S.D.A. Washington, D.C.

8. Logging Farm Wood Crops, Bulletin No. 2090, U.S.D.A., Washington, D.C.

9. Oregon Saw Chain Maintenance Manual. Oregon Saw Chain Division, Omark Industries.

10. Management of Forest Resources For Multiple Use. University Park, Penn.: Dept. of Agricultural Education, The Pennsylvania State University, 1970.

# SERVICING AND MAINTAINING SMALL GASOLINE ENGINES

## A SOURCE UNIT IN AGRICULTURAL MECHANICS

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UNIT: Servicing and Maintaining Small Gasoline Engines

SITUATION:

1. Many people lack the knowledge and skills required for the general operation and maintenance of small gas engines.
2. Students are not fully aware of potential problems and how to effectively correct them.
3. There is a lack of concern with most individuals on safety precautions in handling small gas engines.
4. Pre-requisites: Basic Agricultural Mechanics
5. Length of unit: 4-6 weeks (dependent on scope of material to be covered and prior ability of students); Spring semester.
6. Grade level: 11-12; adaptation can be made for an adult education program.

MOTIVATIONAL ACTIVITIES:

The instructor will provide a lawnmower with a small gas engine as a demonstration model to be used in the classroom. The instructor will attempt to start the engine, without telling the class he had previously sabotaged it. Upon failing to start the machine, the instructor will ask several students to try to start it. After their attempts fail, the instructor will lead into the following question: "You have just seen the results of what can happen to both the machine and individual when this engine failed to start. Why is it important that we understand the mechanics and safety requirements in operating such an engine?"

MOTIVATIONAL QUESTIONS:

1. How many of you have ever operated a lawnmower?
2. What problems have you had in operating the mower?
3. Of those of you who have had problems, how did you go about fixing them? What were the results?

TEACHER OBJECTIVES:

To develop competencies in the students to service and maintain small gas engines. Also to promote the safe and efficient use of such equipment. At the end of this unit, the students will be able to:

TEACHER OBJECTIVES: (Continued)

1. Have a familiarity with the working mechanics of small gas engines.
2. Properly service engine before use.
3. Maintain and service machine during regular use.
4. Determine causes of the more common operating problems of small gas engin
5. Take an effective course of action when a problem situation arises.
6. Prepare a small gas engine for storage.
7. Recognize and correct unsafe conditions that are associated with engines.
8. Store gasoline properly.

CONTENT:

A. Using the Operator's Manual.
B. Using safety precautions.
C. Understanding how a gas engine works.
D. Recognizing the basic engine parts.
E. Cleaning the air cleaner.
F. Selecting lubricants.
G. Trouble-shooting.
H. Storing the engine.
I. Storing gasoline.
J. Maintaining a log sheet on maintenance.

SUGGESTED QUESTIONS AND POSSIBLE ANSWERS:

A. What is an Operator's Manual and how is it used?
   - It is a booklet suppiled by the manufacturers when a new gasoline engine is sold. The Operator's Manual tells how to operate and care for the engine and related components. It gives pertinent information on cleaning, lubrications, adjustments and the overall care of the engine. It also gives recommendations for safe operating procedure.

B. What safety precatuions should everyone follow in operating small gas engines?
   - Maintain machine control.
   - During operation, keep people and pets away.
   - Do not let small children operate the engine.
   - Keep hands, feet and loose clothing away from moving parts.
   - Stop the engine and disconnect the spark plug when working on an engine.
   - Use proper safety shields.
   - Run the engine at a reasonable speed.
   - Lawnmower safety:
     a. Do wear shoes.
     b. Cut across steep slopes.
     c. Avoid rocks and other foreign objects in the lawn.
     d. Do not pull a rotary mower backwards when cutting the lawn.

C. What should we know in order to understand how a gas engine works?
1. The three basic functions necessary for proper engine operation are:
   a. Correct amount (and proportion) of fuel-air mixture.
   b. Adeuqate compressions of this mixture.
   c. Ignition at precisely the right time.
2. Types of combustion engines:
   a. Four-stroke cycle engine (References 3, 5, and 9).
   b. Two-stroke cycle engine (References 3, 5, and 9).
3. Basic components of a gas engine:
   a. Cylinder: a chamber in the engine where the gas mixture is compresses and ignited.
   b. Piston: a moveable disk or cylinder within a tube or cylinder, and capable of being driven either forward or backwards in the tube by pressure, thus imparting reciprocatory motion to a piston rod.
   c. Valves: a device used to regulate the passage of materials.
   d. Flywheel: revolving disk on a shaft, used to ensure uniform motion in all working parts of a machine.
4. Major component parts:
   a. Carburetor: the basic purpose is to produce a mixture of fuel and air in proper proportions which an engine will operate on (References 3, 5, and 9).
   b. Ignition: the spark igniting the fuel-air mixture. The ignition system is composed of many different elements, but those that may by serviced by the operator are the spark plug, ignition cable and breaker points.
      1. Spark plug: Clean, check and reset the gap every 100 hours; remove the plug with the correct wrench; check the Operator's Manual for the correct gap.
      2. Ignition cable: Check the cable for wear and tear or soaked with oil.
      3. Breaker points: Must be kept clean and meet squarely. Gap size on most engines is .020 inch.

D. What are the basic parts of a gas engine?
- This questions can be effectively answered through discussion coming about from the previous question.
- Common parts are: cylinder, piston, valves, flywheel, carburetor, spark plug, breaker points, ignition cable, shaft, fuel line, and air cleaner.

E. What is an air cleaner and how should you clean it?
- An air cleaner is a device which is used to remove dust from the intake air. The type of air cleaner you are working with will determine how it is cleaned. The three common air cleaners are:

1. Dry type: Heavy treated paper is used as a filter media. To increase the filtering area, the material is folded like an accordian. Clean by blowing or brushing the dirt out.

2. Oil soaked element air cleaner: Intake air strikes against a fibrous element soaked in oil. The dust particles are held by the oil film. Clean by rinsing in a kerosene mixture, then soaking in oil.
3. Oil bath air cleaner: Incoming air strikes a surface of oil and a fine mist of air and oil is created. It is this mist of oil which collects the dust.

F. What oil should Terry use in her lawnmower?
Select oils on the basis of oil viscosity and oil type:
1. Oil viscosity: describes the thickness of an oil or its resistance to flow.
2. Oil type: detergents or additives within the oil which help keep the engine clean, and gives better lubrication.
3. For best results consult the Operator's Manual for recommendations.

G. When should Ronal change the oil in his lawnmower?
(If the Operator's Manual is not available, follow the recommendations given below:)
1. Use a premium grade oil.
2. At temperatures above (32°F) use SAE No. 30 oil. At temperatures below freezing use SAE No. 20 oil. At temperatures below zero, use SAE No. 10.
3. After every 5 hours of engine operation check the oil level in the crankcase. Add oil if necessary.
4. After 20 hours of engine operation, drain the crankcase and refill with new oil. Change more frequently if operating the engine under dusty conditions.

H. How should I go about trouble-shooting an engine?
- Instructor should take a hands on approach in teaching this section. The fundamentals of trouble shooting are listed in Attachment 1.

I. What problems might the class experience other than engine problems which might affect performance? (References 12)
1. Rotary mower blades:
   a. Blade tracking improperly.
   b. Warped housing.
   c. Bent blade, crankshaft or blade adaptor.
   d. Warped blade.
   e. Blade twisted.
   f. Dull blade.
2. Check V-belts for:
   a. Excessive exposure to oil or grease.
   b. Cut or sliced blade.
   c. Weathering.
   d. Spin burns.
   e. Slippage.
   f. Rubbing.
3. Check throttle and drive controls.
4. Loose nuts and bolts.

J. What procedure should you use in storing your engine?
   - (See Attachment 2)

K. What should Robert know about home storage of gasoline?
   1. Gasoline is very explosive.
   2. Gasoline is heavier than air, and settles in low places.
   3. Storage below ground should be well vented.
   4. Do not store near an ignition source.
   5. Keep gasoline stored in a cool, well vented location.
   6. Never store in trunk or interior of car as the container may explode from internal pressure built up from movement or impact.
   7. Store gasoline in special storage cans not over 5 gallons in size. Never use plastic or glass containers.
   8. The fumes of gasoline are also very toxic to humans and animals.
   9. To prevent quality deterioration:
      a. Control the loss of gasoline through evaporation.
      b. Avoiding gum deposits.
      c. Protection from dirt and water.

L. What information should Jim include in a maintenance log sheet?
   - (See Attachment 3 for a sample log sheet).

EVALUATION AND APPLICATION:

A. Have students maintain notebooks.
B. Administer an identification test on engine parts and functions.
C. Test the ability of the student to diagnose engine problems. Have them give either oral, written or skill demonstrated responses on appropriate corrective measures.
D. Administer a unit test.
E. Have students bring in small gas engines to work on.

MATERIALS AND EQUIPMENT NEEDED:

A. Several small gas engines.
B. Selected hand tools.
C. Spark plugs.
D. Feeler gauge.
E. Spark plug tester.
F. Flywheel removing tools.
G. Overhead viewer.
H. Selected transparencies.
I. Selected oils.
J. Air cleaners.
K. Gasoline.
L. Operator's Manuals.
M. Replacement parts.
N. Selected reference materials.
O. Cleaning solvent.

REFERENCES:

1. Agricultural Equipment and Mechanics. Columbus, Ohio: Ohio Career Education and Curriculum Development, The Ohio State University, 1974.

2. Empirical Determination of Tasks Essential to Successful Performance as a Retail Lawn and Garden Center Equipment Mechanic. Columbus, Ohio: The Department of Agricultural Education, The Ohio State University, 1975.

REFERENCES: (Continued)

3. Farm Tractors. Chicago, Illinois: American Oil Co., Engineering Building FT-53, 1963.

4. Gasoline Engine Guide. Chicago, Illinois: American Oil Co., Form AD-10592-A, 1968.

5. General Theories of Operation. Milwaukee, Wisconsin: Briggs and Stratton Co., Form MS 3553-24.

6. Mac Tools. Washington Court House, Ohio: Mac Tools Inc., Revised periodically.

7. Module Directory for Agricultural Education. Albany, New York: Bureau of Secondary Curriculum Development, The University of the State of New York 1974.

8. Operating the Car Efficiently. Leaders Guide, Unit 3, Storrs, CT: Cooperative Extension Service, University of Connecticut.

9. Palmer, Edward L. Small Gasoline Engines. Bul. 64-61, Storrs, CT: Cooperative Extension Service, Univeristy of Connecticut.

10. Palmer, Edward L. Selecting and Using Your Power Lawn Mower. Bul. 73-3, Storrs, CT: Cooperative Extension Service, University of Connecticut.

11. Palmer, Edward L. Home Storage of Gasoline. Misc Bul. GMS-5, Storrs, CT: Agricultural Engineering Dept., University of Connecticut, 1974.

12. Service Education Product and Business Management Notes. Bloomington, MN: Toro Co., January, 1976.

13. Service School Notebook. Milwaukee, Wisconsin: Briggs and Stratton Corp., Form MS 6628-105, 1975-76.

14. Storing an Engine. Misc Bul., Storrs, CT: Agricultural Engineering Dept. University of Connecticut, 1969.

15. T'NT. Bloomington, Minnesota: Toro and Tecumseh, Form 693512A, 1975-76.

ATTACHMENT 1

TROUBLE SHOOTING

It is not our intention to make a mechanic of anyone. But there are some repairs that the owner can perform that should make the services of a mechanic necessary only at periodic intervals.

Below are some of the common troubles that an operator can correct without calling a mechanic.

Use a systematic method when trying to determine why an engine will not start or fails to run preperly.

| Type of Trouble | Most likely Cause |
|---|---|
| Engine fails to start | No fuel in tank<br>Fuel shut-off valve closed<br>Fuel line clogged<br>Sediment in carburetor<br>Broken or grounded ignition cable<br>Ignition cable loose<br>Spark plug cracked, broken or fouled |
| Engine hard to start | Water in fuel<br>Improper fuel mixture (2 cycle)<br>Improper choking<br>Obstruction in fuel lines or carburetor<br>Improper carburetor adjustment<br>Loose or defective ignition cable<br>Loose spark plug<br>Dirty or corroded breaker points |
| Engine Missing | Spark plug cracked or fouled<br>Improper spark plug gap<br>Dirty or corroded breaker points<br>Ignition cable broken, loose or shorted out |
| Engine Overheating | Choke partly closed<br>Obstructions in air passages |
| Engine lacks power | Air cleaner clogged<br>Improper gas mixture<br>Choke partly closed<br>Overloaded<br>Carburetor out of adjustment |

ATTACHMENT 2

STORING AN ENGINE

A gasoline engine, like any other piece of equipment, requires some special attention when it is not in use.

Short time storage, during the season the engine is being used, should be a handy dry place under cover.

Engines stored for two months or longer should be serviced following the instructions in the Operator's Manual, being careful to do the following:

- With the engine warm, drain the crankcase (four-cycle engine) and refill with fresh oil of proper viscosity and type.
- Completely drain all gasoline from the fuel tank, fuel lines, and carburetor, to prevent gum deposits from forming.
- Remove spark plug and pour about a tablespoon of clean oil into cylinder.
- Replace the spark plug, cleaned and properly adjusted, or insert a new one.
- Thoroughly clean the engine. Remove blower housing and clean all dirt and chaff from cylinder head and fins. Replace blower housing.
- Service the air cleaner.
- Tighten all loose screws and bolts.
- Cover the engine with a piece of canvas or an old blanket and store in a dry place under cover.

When the engine is taken out of storage, remove the spark plug and spin the engine by pulling the starter cord to remove the excess oil from the cylinder. Replace the spark plug. Fill gasoline tank with clean fresh fuel. If the engine was properly serviced for storage, it should be ready for use.

ATTACHMENT 3

MAINTENANCE RECORD

Make of Engine _____ Model _____ Year _____ H.P. _____

TYPE OF WORK

| Date | Serviced Air Cleaner | Changed Oil | Engine Cleaned | Spark Plug Cleaned | Spark Plug Reset | Spark Plug Replaced | Other |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

# OPERATING AND MAINTAINING CHAINSAWS

## A SOURCE UNIT IN AGRICULTURAL MECHANICS

Robert Vimini
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Fall Mountain Regional High School
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UNIT: Operating and Maintaining Chainsaws

SITUATION:

Chainsaws are becoming a more and more popular power tool. Today they are being used on farms, in agricultural businesses and around the home. With this present and growing interest, a real need exists for students to be insructed on chainsaws operation and maintenance. This course is recommended for Sophomores, Juniors, or Seniors. The unit is designed for a five week period of time and is recommended for use as an adult education course. An introductory unit in forestry is recommended as a prerequisite.

MOTIVATIONAL ACTIVITIES:

Two chainsaws must be obtained. Have one chainsaw that has a dirty air filter, dirty engine cylinder fins, a maladjusted carburetor, a worn chain bar, a dull saw chain that may or may not be damaged or chipped and is loose in tension on the guide bar. Have another chainsaw that has a properly adjusted saw chain that is sharp, a normal aligned guide bar, a clean air filter, clean cylinder fins and a properly adjusted carburetor. Then make two cuts through a log with both chain saws in front of the class having the students note and record the length of time it takes both saws to cut through the log. Have the students carefully listen and observe the sound of the chainsaws running, the condition of the chainsaws, and how they cut through the log. The students should particularly note the wood chips being given off, also they should note the condition of the chainsaws when they are shut down.

MOTIVATIONAL QUESTIONS:

1. Has anyone ever operated a chainsaw before?
2. Have any of you observed one being operated?
3. Which one of these chainsaws did it sound like, look like, or cut through wood like?
4. Why, then, is it important that we study and know how to properly operate and maintain chainsaws?

OTHER SUGGESTED MOTIVATIONAL ACTIVITIES:

1. Have a chainsaw dealer discuss with the class chainsaw operation and maintenance, identify the most common problems people have with chainsaws and/or give a demonstration on sharpening and maintaining the chain and guide bar.

2. Have the students find some part needing to be replaced on their own chainsaws. Have them go through the procedure of obtaining that part by ordering it using a chainsaw parts list or by going to a dealer.

TEACHER OBJECTIVES:

To develop the ability of the students in selecting, handling, operating, caring for and maintaining chainsaws for their home or the agricultural business they are employed by or operate.

Specifically to develop these abilities:

1. To understand the operating principles of two stroke cycle engines.
2. To identify the parts of a chainsaw and their functions.
3. To be able to select the proper chainsaw for intended use.
4. To determine and select the proper air fuel mixture safely and properly.
5. To be able to operate a chainsaw properly and safely.
6. To store a chainsaw properly during periods of disuse.
7. To be able to maintain and care for their chainsaw in the following ways:
   a. Adjust the chainsaw carburetor.
   b. Service the air cleaner.
   c. Adjust the chain saw ignition.
   d. Sharpen chainsaws.
   e. Maintain the saw chains.
   f. Select and adjust new chains.
   g. Troubleshoot guide bar problems.
   h. Identify and repair sprocket problems.
   i. Replace and repair the starter recoil and or starter rope.

CONTENT:

1. Operating principles of two stroke cycle engines.
2. Understanding the functions of the major parts of a chainsaw.
3. Selecting a chainsaw.
4. Selecting and mixing the air-fuel mixture safely and properly.
5. Operating the chainsaw properly.
6. Storing the chainsaw.
7. Maintaining and caring for your chainsaw.
8. Recording and maintaining a log sheet on chainsaw maintenance.

Questions, Answers, and Suggested References

A. What principles do we need to know about two cycle engines to understand how a chainsaw operates?
   1. Intake, compression, power and exhaust take place with only two strokes of the piston. There are two strokes for a complete cycle.

   Reference 4, p 5.
   Reference 7, (See Diagram)
   Reference 9, pp 3-6.
   Reference 10, pp 3-6.
   Reference 12, p 3.

CONTENT: (Continued)

Questions, Answers, and Suggested References

B. What are the major parts of a chainsaw and their functions?
Reference 2, p 3.
Reference 9.
Reference 10, pp 1-16; p 139.
Reference 11, pp 3-5, 11-15.

C. What type of chainsaw should we select for our situation?
Reference 2.
Reference 10, pp 3-4.

D. How should we start the chainsaw properly and safely?
Reference 2, pp 6-7.
Reference 10, p 3.

E. What procedure should we follow: when cutting with a chainsaw?
when limbing a tree?
to avoid kickback?
in cutting a log into lengths?
in felling a tree?
in trimming a tree?
Reference 1, pp 95-96.
Reference 2.

F. How should we store our chainsaw during a long period of nonuse?
Reference 1, p 95.
Reference 2, p 10.

G. What procedure should we follow in storing our chainsaw?
Reference 2, p 10.

H. What procedure should we follow in adjusting the chainsaw carburetor?
Reference 2, p 10.
Reference 10, p 99.
Reference 11, p 14.
Reference 12, p 26.

I. How should we service the air cleaner on our chainsaw?
Reference 2, p 9.
Reference 10.
Reference 11.
Reference 12.

J. What procedure should we follow in adjusting the chainsaw ignition?
Reference 2, pp 10-11.
Reference 5.

K. How should we keep our chainsaws sharp?
Reference 2, p 8.
Reference 11, p 16.
Reference 10, p 123.

L. What factors should we consider in maintaining our chainsaw?
Reference 2, pp 8-11.
Reference 10, p 123.
Reference 11, p 16.

M. What procedure should we follow in selecting and adjusting new chains for our chainsaw?
Reference 2, pp 8-11.
Reference 11, p 16.

N. How should we maintain the sawchain?
Reference 2, pp 8-11.
Reference 11, p 16.

O. What procedure should we follow in troubleshooting guide bar problems on our chainsaw?
Reference 2, p 9.
Reference 10, p 5.

P. What factors should we consider in identifying and repairing chainsaw sprocket problems?
Reference 2, pp 9, 16.
Reference 10, p 5.

Q. How should we replace and repair the starter recoil or starter rope?
Reference 2, p 5.
Reference 11, p 11.
Reference 10, p 114.

R. Should we consider recording information and maintaining a log sheet on chainsaw maintenance?
Reference 1, p 96.
Reference 8.

EVALUATION AND APPLICATION:

1. Each student will be tested on his or her ability to perperly start, refuel, operate and stop a chainsaw.
2. Each student must perform the following operating adjustments on a chainsaw
   a. Adjust the carburetor.
   b. Maintain proper saw chain tension.
3. Each student must be able to sharpen a worn chain. They will be evaluated on their ability to correctly do so with necessary depth and angle gauges.
4. Each student must be able to replace a drive link in a saw chain.

EVALUATION AND APPLICATION: (Continued)

5. Each student must be able to service and replace a fouled or worn spark plug for a chainsaw.
6. The students must list the safety precautions to consider when operating a chainsaw.
7. A notebook must be kept by each student. There will be a weekly notebook check.
8. Unit examination.

MATERIALS AND EQUIPMENT NEEDED:

1. Chainsaws provided by the school and/or by the students.
2. Small engine hand tools.
3. Spark plug feeler gauge.
4. Different types of spark plugs.
5. Ignition file.
6. Saw chains and guide bars in disrepair.
7. Saw chain sharpening tools - files, vises, guides and gauges.
8. Gasoline.
9. 2 cycle engine oil.
10. Chain bar oil.
11. Overhead projector.
12. Replacement parts for the chainsaws.

REFERENCES AND INSTRUCTIONAL AIDS:


1. Handyman - Complete Guide to Home Maintenance. New York: Banner Press, Inc., 1975.
2. Remington Chain Saw Owner's Manual. Desa Industries, 25000 S. Western Avenue, Park Forest, Illinois.
3. Forestry - A Curriculum Guide for High School Vocational Agriculture. U.S. Department of Health, Education and Welfare, Office of Education.
4. Palmer, Edward L. Small Gasoline Engines. Storrs, Connecticut: University of Connecticut.
5. Grounds Maintenance. "How to Service Ignition Systems for Small, Air-Cooled Engines.: March 1976.
6. Palmer, Edward L. Home Storage Of Gasoline. Storrs, Connecticut: University of Connecticut.
7. How A Two-Stroke Engine Operates-DIAGRAM. Robert Vimini, Vo-Ag Instructor, Fall Mountain Regional High School, Marlowe, New Hampshire.
8. Chainsaw Maintenance Log Sheet. Robert Vimini, Vo-Ag Instructor, Fall Mountain Regional High School, Marlowe, New Hampshire.
9. Parts of the Chainsaw-TRANSPARENCY. Robert Vimini, Vo-Ag Instructor, Fall Mountain Regional High School, Marlowe, New Hampshire.
10. Chainsaw Technician Workbook. Ken Cook Transnational 9929 W. Silvers Spring Road, Milwaukee, Wisconsin, 1968.
11. Chainsaw Service Manual, Technical Publications Division, 1014 Wyandotte Street, Kansas City, Missouri.
12. Small Engines Service Manual.

# EQUITATION: IMPROVING RIDING SKILLS

## A SOURCE UNIT IN ANIMAL SCIENCE

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UNIT: Equitation: Improving Riding Skills

SITUATION:

This source unit is designed as a Vo-Ag III elective with a suggested teaching time of three weeks. The students should have a definite interest in improving riding skills, most of them should own horses. It is assumed that the student has had a unit in horsemanship.

MOTIVATIONAL QUESTIONS:

1. How many of you have competed in a horse show?
2. Have you ever rented a horse from a stable?
3. What abilities make a good rider?
4. Why is it important to be able to ride properly?

MOTIVATIONAL ACTIVITIES:

1. Visit a stable early in the unit to review horsemanship abilities.
2. Observe riders at a horse show. Try to place the class as the judge must do.
3. Observe some national competition on television.

TEACHER OBJECTIVES:

Equitation is the art of riding a horse intelligently, gracefully and well, with the greatest degree of comfort and enjoyment to both horse and rider Upon completion of this unit, the student will know and be able to demonstrate proper riding techniques.

CONTENT:

No amount of book learning can substitute for time spent on a horse under the direction of a good instructor. The student who rides the most will usuall be the best. This unit will give students some knowledge of proper riding tech niques.

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| A. What must we know in order to become a good horseback rider? | 1. How to find a good instructor.<br>2. A knowledge of the horse's physical and mental abilities.<br>3. A knowledge of human physical and mental abilities.<br>4. How to select a horse that "fits".<br>5. The rules of good equitation.<br>6. What the judge at the horse show is looking for |
| B. What are some things a rider must know before mounting? | 1. Discuss safety precautions while riding. Reference 1, p 74.<br>2. Discuss proper equipment for each type seat. Reference 7, 4-H series.<br>3. Bring in tack and demonstrate:<br>a. Western seat.<br>b. Saddle seat.<br>c. English seat.<br>4. Discuss proper mounting. Reference 4, pp 79-103.<br>5. Visit a student program and observe and practice proper horsemounting. |
| C. What are the first things to master after sitting on a horse? | 1. Work for basic seat. Refer to any good book on Equitation. Reference 2.<br>2. Use the blackboard to draw a stick figure of proper posture.<br>3. Once the ideal seat is achieved it should be maintained, with slight alteration, during all gaits. |
| D. How do I make the horse move out preperly? | 1. Show a movie on Equitation, available from many breed association. References 3,5.<br>2. Gather reins, get attention, squeeze legs, move to giving hands,(loosen reins). |
| E. How should the rider look at the walk? | 1. Instructor should draw gaits on the board.<br>2. Look for proper posture:<br>a. Body erect.<br>b. Head up.<br>c. Eyes straight ahead.<br>d. Upper arms at sides.<br>e. Legs under body.<br>f. Toes up and in.<br>g. Flexible waist.<br>Reference 4, p 150. |

CONTENT: (Continued)

| Problems and Concerns | Guides to Solutions and Examples of Teaching Techniques |
|---|---|
| F. How should the rider look at the trot? | 1. Same basic seat as a walk.<br>2. In English Equitation, rider should post (posting is rising out of the saddle when the outside front leg is up).<br>3. Draw a stick figure of proper posture.<br>4. The trot is the basic gait to do most equitation work. |
| G. How should the rider look at the canter? | 1. Emphasize that the basic seat should be maintained.<br>2. The rider should sit as deep as possible in the saddle, upper body leaning slightly forward (draw stick figure on board).<br>3. The rider should be able to determine whether or not the horse is on the correct lead (inside front foot hits first). |
| H. What is a proper dismount? | 1. Demonstrate when on a field trip.<br>2. Drop stirrups and slide off.<br>3. Hold reins while dismounting so horse doesn't get loose.<br>4. Don't linger, dismount quickly. Reference 4, pp 79-100. |
| I. How should I cool my horse off properly? | 1. Discuss why to cool:<br>a. To prevent founder.<br>b. To relieve discomfort.<br>2. To properly bring a horse's metabolism to the resting condition:<br>a. Loosen the girth (slightly).<br>b. Walk to the barn.<br>c. Remove tack.<br>d. Walk until cooled.<br>e. Brush out saddle marks.<br>f. Clean feet.<br>g. Give a small reward if deserved. |
| J. How should I store my equipment? | 1. Saliva and sweat should be removed after each ride.<br>2. Wipe equipment with a damp sponge.<br>3. Oil equipment occasionally.<br>4. The teacher should demonstrate proper cleaning methods to the class (have students bring in, clean, and oil equipment). |

REFERENCES:

1. Scheid, Dan W. How to Buy a Healthy Horse, Fort Atkinson, Wisconsin: Highsmith Co., Inc., 1972.

2. Ulmer and Juergenson. Approved Practices in Raising and Handling Horses. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1974.

3. Kays, John M. Basic Equitation, Cooperative Extension Service, University of Connecticut, Storrs, Connecticut.

4. Haley. How to Teach Group Riding. New York: A.S. Barnes and Co., 1970.

5. 16 m.m. movie, The All American Horse, Venard Organization, 113 NE Madison Avenue, Peoria, Illinois.

6. The Instructors Handbook of the British Horse Society and The Pony Club. The Pony Club Organization, The British Horse Society, Printed by W.E. Baxter Limited, Lewis, England, 1962.

7. Horse Science, 4-H Horse Series, Cooperative Extension Service, Universit of Connecticut, Storrs, Connecticut.

# MAINTAINING HERD HEALTH

## A SOURCE UNIT IN ANIMAL SCIENCE

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UNIT: Maintaining Herd Health

SITUATION:

This source unit is designed for students enrolled in Vo-Ag III or IV. The students have had basic units in animal care, terminology, and management. All students have a supervised occupational experience program which has given them an opportunity to work with various types of livestock. The students have various backgrounds of knowledge and skills regarding different livestock and the prevention, control, symptoms and treatment of common health problems. This unit is prepared for a 4-5 week period, 20-25 days, 1½ hours/day.

UNIT OBJECTIVES:

Each student should be able:
1. To identify the importance of maintaining herd health.
2. To recognize the various factors which affects herd health.

CONTENT:

A. Objective: To identify the importance of maintaining herd health.

Questions:
1. What herd health problems have you had?
2. How have the problems affected you and others economically? With regard to safety?
3. Have any of you ever treated an animal? For what? What were the results?
4. What should we know to properly maintain herd health?

Activities:
1. Have the students read a current magazine article regarding a herd health problem.
2. Take a field trip to identify common herd health problems.
3. Have a resource person (veterinarian or herd owner) discuss herd health with the class. Stress economics, the role of the owner in maintaining herd health, and implications for safety.
4. Have the students list the knowledge and skills needed to maintain herd health.

CONTENT: (Continued)

Evaluation: 1. Have students develop a list of questions to be answered on a field trip or by a speaker.
2. Have the students hand in the answers to the questions. Grade according to completeness and accuracy.

B. Objective: To identify the various factors which affect herd health.

Questions: 1. What should an animal owner know about herd health?
- History of animals in the herd.
- Personal knowledge of diseases.

2. What factors might affect the health of our animals?
- Our management skills
- Sanitation
- Housing
- Feeding Practices
- Weather
- Parasites
- Humidity
- Handling or animal abuse
- Equipment malfunctions (improper management)
- Epidemics
- Replacement selection vaccination program
- Drafts
- Use of a veterinarian
- Breeding problems
- Records
- Economics
- Time

Activities: 1. Have each student write out their own thoughts on the two questions identified above.
2. Conduct class discussion. Develop a master list of things to know and factors to consider.
3. Take a field trip to a local enterprise (livestock), and survey the identified factors, and interview the owner.

C. Objective: 1. To identify the common diseases or health problems related to the student's livestock and those common to all livestock.
2. To identify the symptoms, prevention, control and treatment of 20 common livestock diseases or health problems of interest to the students.

Questions: 1. What are the common health problems with animals of interest to you?
2. What are the common symptoms of each?
3. How can each be prevented?
4. How is each controlled effectively?
5. How is each treated Properly?

CONTENT: (Continued)

Activities: 1. Have students list common terms. (Example - quarantine.)
2. Have each student give an oral report in class on one or more diseases or health problems.
3. Take one field trip to each type of livestock which is appropriate based upon the interests of the students.
4. Have the students research the disease and health problems identified.

Evaluation: 1. Collect written information on the 20 problems.
2. Have students give oral report - no reading.
3. Administer a test on terminology.

D. Objective: To handle and restrain livestock safely, humanely, and properly.

Questions: 1. How many of you have ever restrained animals?
2. Under what conditions do you have to restrain animals?
3. What factors should we consider when restraining animals?

Activities: 1. Each student is shown how to handle and restrain properly for:
a. dehorning
b. giving shots
c. moving
d. observing and diagnosing
e. treating cuts
f. others
2. Each student properly handles and restrains various livestock.
3. Take field trips to practice animal restraint.
4. Show a film on proper techniques of restraint.

Evaluation: 1. Develop a check list of the proper techniques of restraining animals.
2. Have the students evaluate themselves using the checklist as a reference.
3. Have other class members evaluate each student.
4. Complete a teacher evaluation of each student.

E. Objective: To sanitize animal housing facilities and equipment effectively to prevent diseases and health problems.

Questions: 1. When is sanitizing necessary?
2. What is used to sanitize?

**CONTENT:** (Continued)

**Activities:**
1. Have the students survey the sanitation practices of herd owners in the area.
2. Take a field trip to a barn to sanitize facilities and equipment.
3. Prepare and discuss handouts on types of sanitizers and organisms which can be controlled.
4. Make a class presentation. Conduct class discussion.

**Evaluation:**
1. Have students hand in and discuss survey results.
2. Test.
3. Evaluate the application of competencies to students situations.

F. **Objective:**
1. To identify the proper health records to keep.
2. To keep proper health records.

**Questions:**
1. What should be included in the health records?
2. What format is best?
3. Who should keep the records?
4. Where should the records be kept?

**Activities:**
1. Illustrate the different records and record systems.
2. Discuss the importance of maintaining good herd health records.
3. Take a field trip to observe health records.
4. Prepare worksheets for the students to complete when given.

**Evaluation:**
1. Completion of worksheets.
2. Quiz.

G. **Objective:**
1. To list common medicine needed in a specific livestock medicine cabinet.
2. To describe the purpose of the contents in a well supplie livestock medicine cabinet.

**Questions:**
1. What are the common diseases which a farmer is qualified to treat?
2. What diseases can be prevented through proper use of medication?
3. What medicine is needed?
4. How long can medicine be kept and still be effective?
5. What equipment is needed?
6. Where should the cabinet be located?

**Activities:**
1. Show slides of well stocked medicine cabinets.
2. Have a farmer speak to the class to discuss the role of preventive medicine in his enterprise.
3. Student Report.
4. Have students survey farms to determine what medicines ar kept.

CONTENT: (Continued)

Evaluation: 1. Have students hand in survey.
2. Have the students explain various medicines and their use when asked in class.

H. Objective: The students will know and give reasons for the various health laws.

Questions: 1. Who governs the laws effecting animals?
2. For what reasons are laws made regarding animals?
3. What are the laws regarding the transportation of animals?
4. What are the laws regarding showing?

Activities: 1. Invite a cattle dealer to class as a resource person.
2. Invite a speaker from the State Department of Livestock.

Evaluation: 1. Worksheets; problem solving.
2. Quiz.

I. Objective: To identify the various means of applying medication.

Questions: 1. What medication can you legally give?
2. How is it given properly?

Activities: 1. Take a field trip.
2. Combine the field trip with a demonstration by the veterinarian.

Evaluation: 1. Have the students fill out a worksheet.
2. Test.

REFERENCES:

Hoard's Dairymans Herd Health Guide. Fort Atkinson, Wisconsin: W.D. Hoards and Sons Co., 1975.

Ensminger, M.E. The Stockmans Handbook. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1970.

Gibbons, W.J. Clinical Diagnosis of Diseases of Large Animals. Philadelphia: Lea and Febiger, 1966.

Seigmund, O.H. The Merck Veterinary Manual. Rahway, New Jersey: Merck and Co., Inc., 1967.

Stumm, G.W. Veterinary Guide for Farmers. New York: Hawthorn Books, Inc., 1963.

# SELLING FARM AND GARDEN SUPPLIES

## A SOURCE UNIT IN AGRICULTURAL SUPPLIES

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UNIT: Selling Farm and Garden Supplies

SITUATION:

This is a required unit for all students enrolled in the third year of vocational agriculture. The unit will be three weeks in length, meeting two periods per day. The Regional Vocational-Agriculture Center at Glastonbury High School is located in a metropolitan-urban area and a large number of students have jobs in retail establishments. There are also many opportunities in retail selling for graduates.

MOTIVATIONAL QUESTIONS:

1. What is the key function of all business activities? Why?
2. How many of you have ever purchased in item from a salesperson? What was your reaction to that person's approach?
3. How many of you are now or have ever been a salesperson? How did you approach the customer? Did you make the sale? Why did you not make the sale?

MOTIVATIONAL ACTIVITIES:

1. Have the students bring an item or tool commonly sold in a farm and garden store to class. Have the students identify the important features and the benefits of each feature of the item or tool.
2. Have the students develop a list of the characteristics they like in a salesperson.

TEACHER OBJECTIVES:

1. Each student will have basic knowledge of salesmanship, merchandising and general retail store operations.
2. Each student will have practiced display building, sales techniques, operation of the cash register, use of the telephone and completing sales slips

CONTENT:

| Objectives | Activities |
|---|---|
| A. Each student will know the elements of effective displays. | 1. Each student will develop a list of the elements of a good display. |

CONTENT: (Continued)

| Objectives | Activities |
|---|---|
| | 2. Have the class visit a retail establishment to observe good displays. Continue listing the elements of a good display.<br>3. In class, discuss the elements of good displays and have students complete the list.<br>4. Show slides of good and bad displays to the class and discuss. |
| B. Students will be able to build effective displays. | 1. In the classroom have each student set-up a mock display with different agricultural products.<br>2. Have the distributive education teacher evaluate the displays and discuss effective displays in class. |
| C. Students will be able to maintain merchandise displays. | 1. Have the students list all the activities that have to be done to maintain effective displays.<br>2. Have the class visit a retail establishment. Each student is assigned a display section and works for one period on maintenance. |
| D. The student knows the attributes of a good salesperson. | 1. Have the students discuss the attributes of a good salesperson.<br>2. Have the class develop a list of attributes of a good sales person.<br>3. A complete list is typed and distributed to students to file in notebooks. |
| E. The student knows the duties and responsibilities of the retail salesperson. | 1. Each student develops a list of duties and responsibilities based on experiences.<br>2. Share lists in class and discuss.<br>3. Visit a retail establishment and discuss responsibilities with manager.<br>4. Present to the students a complete list of duties as developed by the students, the employers and the teacher. |
| F. The student understands and can demonstrate the principles of successful selling. | 1. Present to the students the steps in selling.<br>2. Have the students bring from home a favorite item with which they are very familiar. Have them integrate the features and benefits of the item into a simulated sales presentation.<br>3. Using sample products, and a display counter, role play the complete sales process. Have the students discuss each presentation. |

CONTENT: (Continued)

| Objectives | Activities |
|---|---|
| G. The student will be able to identify the different parts of the cash register and explain the function of each part. | 1. Ask the students to identify the different parts of the cash register.<br>2. Hand out a list of definitions. |
| H. The student will be able to operate the cash register properly by first preparing the cash register for the transactions of the day. | 1. Using a series of practical exercises the student will practice on a cash register.<br>2. Have a second student check progress, speed, and accuracy. |
| I. The student will be able to complete the change making process. | 1. Using a series of practical exercises the students will practice making change.<br>2. Have a second student observe speed and accuracy. |
| J. The student will be able to answer the telephone effectively. | 1. Role-play using the handout "Answering a Call" Discuss after using with two students.<br>2. Use the teletrainer unit (available from the telephone company) for demonstrating the proper telephone procedure in answering a call. Have the students practice. |
| K. The student will be able to place a call efficiently. | 1. Role-play, using the handout "Placing a Call", Discuss after using with two students.<br>2. Use the teletrainer for demonstration and have the students practice. |
| L. The student will be able to take a message without errors. | 1. Develop listening skills. Discuss the importance of developing listening skills.<br>2. Role play "taking directions".<br>3. Practice taking messages. |

EVALUATION AND APPLICATION:

1. Written Tests.
2. Practical test on ability to perform objectives.
3. Evaluation of presentations.
4. Have the students apply on the job the knowledge and skills developed. Have them report the results to the class.

MATERIALS AND EQUIPMENT NEEDED:

1. Cash Registers.
2. Teletrainer (Southern New England Telephone Company).

3. Overhead Transparencies:
   - Use of the Cash Register.
   - Use of the Telephone.
4. Sales display area and Counters.
5. Agricultural supplies (For Classroom Display).
6. Student References.

INSTRUCTIONAL AIDS AND REFERENCES:

1. Farm and Garden Magazines.

2. Seed and Farm Supply Magazines.

3. Wholesale Catalogs.

4. Product Information Literature.

1. Viens, Daniel, and LaPorte, Wayne. Distributive Skills. Hartford, Connecticut: State Department of Education, 1975.

2. Walsh, Lawrence, Joy, Robert, and Hoover, Norman. Selling Farm and Garden Supplies. New York: McGraw-Hill Book Co., 1971.

3. Wingate, John and Nolan, Carrol. Fundamentals of Selling. Cincinnati, Ohio: South Western Publishing Co., 1964.

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